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DRAWINGS ATTACHED.

*Date of Application and filing Complete Specification:*  
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### COMPLETE SPECIFICATION.

#### Improvements in Methods of Manufacturing Elastically Deformable, Permanently Magnetic Bands.

We, ROBERT BOSCH G.m.b.H., a German Company, of 4, Breitscheidstrasse, Stuttgart-W, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a method for the manufacture of an elastically deformable magnetisable band, which is particularly suitable for use as or in conjunction with sealing and closing strips for doors and flaps, especially for refrigerators, and which is composed of magnetisable granular particles embedded in an elastic binding agent.

Hitherto, such permanently magnetic bands could be made only with a relatively low content of barium ferrite. These bands had a correspondingly low adhesive power.

According to the present invention, there is provided a method of manufacturing an elastically deformable magnetisable band which comprises masticating natural rubber containing an accelerator or cross-linking agent on a roller mill at a temperature of 150 to 170°C. until it drops off the rollers. The rubber as it drops off the rollers is capable of taking up to 94% by weight of magnetisable granular particles, preferably consisting of barium ferrite. When the magnetisable particles have been incorporated in the rubber, a band produced therefrom is vulcanised and can then be magnetised.

The invention is further described with reference to the accompanying drawings which illustrate a preferred embodiment by way of example and in which:—

Fig. 1 is a diagrammatic view of the magnetising apparatus,

[Price .

Fig. 2 is a general circuit diagram of the electrical part of the apparatus; and

Figs. 3 to 8 show various arrangements of the bus-bar and band.

Referring to the drawings, a band 1 consists of natural rubber containing a cross-linking agent and barium ferrite. The magnetisable particles used in the mixture are barium ferrite particles having an average particle size of preferably 50 to 300μ. The band is formed by masticating a mixture of natural rubber cross-linking agent, 2-Mercapto benzthiazole and paraffin on calendaring rollers which are heated at a temperature of 150 to 170°C. The rolling is continued until the mass drops from the rolls. Barium ferrite particles are then mixed into the mass. Vulcanising agents made as sulphur or zinc oxide are added and the mixture is vulcanised in the form of a band which can be subsequently magnetised.

The band is first wound onto a spool 2, shown in Figure 1, and is conveyed therefrom to a spool 3 onto which it is wound. A bus-bar 4, which is part of an electrical magnetising apparatus 5, is arranged along the path of the band 1 between the two spools.

The electrical magnetising apparatus 5 comprises a charging instrument 6 which can be connected to the mains. From this charging instrument conductors 7 lead to a condenser 8 which is connected into a circuit having an ignition 9, a resistor 10 and the above mentioned bus-bar 4, these elements being connected in series by electrically conducting leads. The band 1 is magnetised by a continuous process in which the spool 3 is rotated so that the band unwinds off the spool 2 and travels over the bus-bar 4 where it is magnetised

in sections by current impulses flowing at regular intervals through the bus-bar, the band being finally wound onto the spool 3. The intervals between the discharging current impulses and the speed at which the band is moved over the bus-bar are so adjusted relatively to one another that, shortly before the end of the magnetised part or section of the band leaves the region of the bus-bar, a new current discharge is released. The band is thereby magnetised continuously, the ends of successive magnetised sections overlapping as shown in Fig. 1 where the sections magnetised by a current impulse are indicated by the reference 1 and their overlapping ends by the reference s.

With this type of magnetisation, it is advantageous to provide a longitudinal groove along the middle of the band, which is moved over the bus-bar, so that the section of the band on one side of the groove is charged opposite to the section on the other side. This arrangement of bus-bar and band is shown in cross-section in Fig. 3. In the arrangement shown in Fig. 4, the current in the part of the conductor near the band runs in one direction and in the parts of the conductor remote from the band it runs in the opposite direction. This arrangement of the bus-bar requires smaller current impulses than the arrangement of a single conductor over which a section of the band moves. Moreover, the arrangement in Fig. 4 also provides a better magnetic field. Other possible arrangements for the bus-bar are shown in Figs. 5 to 7.

In Fig. 8, the bus-bar is sinuous in shape. This arrangement is suitable for magnetising a broad band which can then be cut along the dotted lines 12 after it has been magnetised, or alternatively, an arrangement can be used for magnetising a number of narrow bands simultaneously.

#### WHAT WE CLAIM IS :—

1. A method of manufacturing an elastically deformable magnetisable band which comprises masticating natural rubber con-

taining an accelerator or cross-linking agent on a roller mill at a temperature of from 150° to 170°C until it drops off the rollers, incorporating up to 94% by weight of magnetisable granular particles in the masticated rubber, and vulcanising the rubber in the form of a band.

2. A method as claimed in claim 1 further including magnetising the band.

3. A method as claimed in claim 1 or 2, in which the magnetisable granular particles are composed of barium ferrite.

4. A method as claimed in claim 3, in which the barium ferrite particles have an average particle size from 50 to 300 $\mu$ .

5. A method as claimed in any of claims 1 to 4, in which the accelerator is 2-mercapto-benzothiazole.

6. A method as claimed in any of claims 1 to 5, in which paraffin is added as additional plasticiser.

7. A method as claimed in claim 1 substantially as hereinbefore described with reference to any of the accompanying drawings.

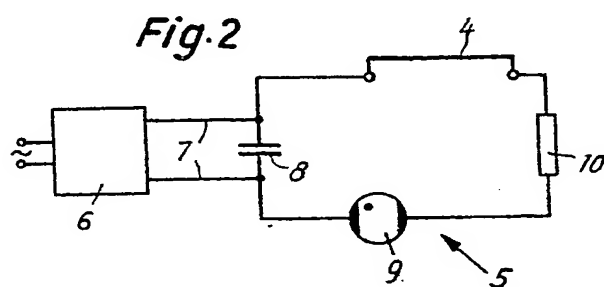
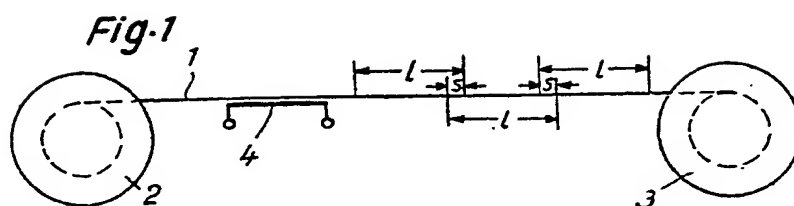
8. An elastically deformable magnetisable band whenever produced by the method claimed in any of the preceding claims.

9. A method for magnetising the band produced by the method claimed in any of claims 1 to 7, which comprises supplying discharge current impulses from a condenser to an electrical conductor arranged along at least one section of the band.

10. A method as claimed in claim 9, in which the band to be magnetised is unwound off a spool, conveyed along the conductor and then wound onto another spool.

11. A method as claimed in claim 9 substantially as hereinbefore described with reference to any of the accompanying drawings.

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**Fig.3**



**Fig.4**



**Fig.5**



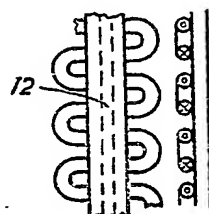
**Fig.6**



**Fig.7**



**Fig.8**



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